

**What is Claimed is:**

1. A speaker configuration for stereo sound reproduction in a vehicle which has a plurality of speakers installed therein, said speaker configuration comprising:

5 a first speaker provided in the left of a front central part of the vehicle for receiving a right channel output; and

a second speaker provided in the right of the front central part of the vehicle for receiving a left channel output.

10 2. A speaker configuration for stereo sound reproduction according to claim 1, wherein said first speaker and said speaker are arranged at the height within  $\pm 50\text{cm}$  from the height of the speakers previously installed in the vehicle.

15 3. A speaker configuration for stereo sound reproduction according to claim 1, wherein each of said first and second speakers is a full-range speaker for reproducing both of low-frequency and high-frequency sounds.

20 4. A speaker configuration for stereo sound reproduction according to claim 1, wherein each of said first and second speakers is a two-way speaker which is separated into a low-frequency speaker and a high-frequency speaker.

25 5. A speaker configuration for stereo sound reproduction according to claim 1, wherein each of said first and second speakers is a coaxial speaker which is separated into a low-frequency speaker and a high-frequency speaker which are coaxially bound.

6. A speaker configuration for stereo sound reproduction according to claim 1, wherein each of said first and second speakers is a high-frequency speaker (tweeter).

7. A speaker configuration for stereo sound reproduction according to claim 6, wherein said first speaker is oriented toward a left front seat in the vehicle, and said second speaker is oriented toward a right front seat in the vehicle.

5 8. A signal processor for stereo sound reproduction, in a vehicle which has a plurality of speakers and a powered head unit installed therein, in use for a speaker configuration including a first speaker provided in the left of a front central part of the vehicle for receiving a right channel output and a second speaker provided in the right of the front central part of the vehicle for receiving a left channel output, said signal processor comprising:

10 an equalizer for compensating the frequency characteristics of a front left channel output and a front right channel output inputted from the powered head unit according to the front speaker configuration in the vehicle and the vehicle type and distributing the left channel outputs as many as the front speakers for the left side and distributing the right channel outputs as many as the front speakers for the right side.

15 9. A signal processor for stereo sound reproduction for vehicle according to claim 8, further comprising:

20 a low-frequency pass filter for passing low-frequency components of a rear left channel output and a rear right channel output inputted from the powered head unit while performing a heavy damping in frequency bands beyond the range of the low-frequency components.

25 10. A signal processor for stereo sound reproduction for vehicle according to claim 9, wherein said low-frequency pass filter passes low-frequency components in the range of 80 to 1000Hz while performing a heavy damping in frequency bands beyond the low-frequency range.

11. A signal processor for stereo sound reproduction, in a vehicle which has a plurality of speakers and a non-powered head unit installed therein, for a speaker configuration including

a first speaker provided in the left of a front central part of the vehicle for receiving a right channel signal; and a second speaker provided in the right of the front central part of the vehicle for receiving a left channel signal, said signal processor comprising:

an earlier reflection processing unit for adding earlier reflections to a left  
5 channel signal and a right channel signal inputted from the non-powered head unit;

an equalizer for compensating the tone of output signals from said earlier reflection processing unit according to the front speaker arrangement in the vehicle and the vehicle type; and

a first volume controller for controlling the volume of output signals from said  
10 tone compensating unit, and distributing the left channel signal as many as the front speakers for the left side and distributing the right channel signal as many as the front speakers for the right side to output respective signals to amplifiers for front speakers.

12. A signal processor for stereo sound reproduction for vehicle according to claim 11,  
15 wherein said earlier reflection processing unit adds 0 to 20 number of earlier reflections.

13. A signal processor for stereo sound reproduction for vehicle according to claim 11,  
further comprising:

a first delay unit for delaying the left channel signal and the right channel signal  
20 inputted from the non-powered head unit for a certain period of time to remove the localization of a rear sound image;

a later reverberation processing unit for adding later reverberations to the output signals of the first delay unit;

a first low-frequency pass filter for passing low frequency components of the  
25 signals reverberated from the later reverberation processing unit while performing a heavy damping in frequency bands beyond the range of the low-frequency components; and

a second volume controller for controlling the volume of the output signals from said first low-frequency pass filter to output the controlled signals to amplifiers for rear speakers.

14. A signal processor for stereo sound reproduction for vehicle according to claim 13, wherein said first delay unit delays the signals for a time period of 0 to 10 milliseconds.

5 15. A signal processor for stereo sound reproduction for vehicle according to claim 13, wherein said later reverberation processing unit adds the later reverberations for 0 to 3 seconds.

16. A signal processor for stereo sound reproduction for vehicle according to claim 13, wherein said first low-frequency pass filter passes the low-frequency components in the range of  
10 80 to 1000Hz while performing a heavy damping in frequency bands beyond the low-frequency range.

17. A signal processor for stereo sound reproduction for vehicle according to claim 16, further comprising:

18 a second delay unit for delaying a combined signal of the left channel signal and the right channel signal from the non-powered head unit to remove the localization of the rear sound image;

19 a second low-frequency pass filter for passing low-frequency components of an output signal from said second delay unit while performing a heavy damping in frequency bands  
20 beyond the range of the low-frequency components; and

a third volume controller for controlling the volume of an output signal from said second low-frequency pass filter to feed the signal to a sub-woofer amplifier.

18. A signal processor for stereo sound reproduction for vehicle according to claim 17, wherein said second delay unit delays the combined signal for a time period of 0 to 10  
25 milliseconds.

19. A signal processor for stereo sound reproduction for vehicle according to claim 17, wherein said second low-frequency pass filter passes low-frequency components in the range the same as or lower than 80Hz while performing a heavy damping in frequency bands beyond the low-frequency range.

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20. A vehicle having a dashboard installed with a plurality of speakers, comprising:

a first speaker installed in a central left part of the dashboard of the vehicle for receiving a right channel output; and

a second speaker installed in a central right part of the dashboard of the vehicle  
10 for receiving a left channel output.

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